Customer No.: 31561
Application No.: 10/064,423
Docket No.: 8853-US-PA

AMENDMENTS

To the Claims:

Please amend the claims as follows:

1. (Currently amended) A handwritten numeral classifier using fuzzy logic and cellular neural network, comprising:

an extraction unit using cellular neural network for receiving a scanned image having a plurality of input features, wherein the extraction unit is constructed of 24 cascaded cells to form the 24x24 pixels feature extractor comprising of a plurality of cell circuits, wherein each cell circuit comprise of 4 cascade current mirrors connected to the output of the cell circuit, the extraction unit having 4 transmission gates controlling the input of the extraction unit, wherein the input signal of the extraction unit is connected to the input of the transmission gates through a transistor, and compressing the received data of the scanned image to generate a plurality of feature values;

a membership function generator using fuzzy logic for storing a plurality of membership functions and receiving the feature values to generate a plurality of synthesis membership function degrees for the plurality of input features;

a k-WTA circuit for receiving the plurality of synthesis membership function degrees from the membership function generator and outputting the synthesis membership degrees in order of magnitude;

an I/O circuit for inputting programming codes to the membership function generator through off-chip memory units and receiving the synthesis membership degrees from the k-WTA circuit to output a final recognizing result of the scanned image; and

a clock generator and logic controller for generating clock cycle and control logic signals for controlling timing of and logic for operations of the extraction unit, membership function generator, and the k-WTA circuit.

2. (Original) The classifier in claim 1, wherein the I/O circuit and the k-WTA circuit both have 11 corresponding ports.

3. (Original) The classifier in claim 1, wherein the membership function generator further comprising:

a membership function generator array respectively corresponding to each one of the plurality of the input features for storing the plurality of membership functions and generating a plurality of current-type membership function degrees for the plurality of the input features; and

a plurality of switched-current integrator corresponding to the membership function generator array for receiving the plurality of membership function degrees and generating a plurality of synthesis membership degrees.

4. (Original) The classifier in claim 3, wherein the membership function generator array is 10x10.

5. (Original) The classifier in claim 3, wherein the number of SI integrator includes 10.

6. (Original) The classifier in claim 5, wherein each of the plurality of SI integrators includes a plurality of storage units constructed by a Regulated–Gate Cascade structure.

7. (Original) The extraction unit in claim 1, wherein the extraction unit further comprising: a connected components detector extractor with a cellular neural network structure for speedily extracting the input features of a scanned numeral image; and

a compression unit for compressing bits of the input features into small and meaningful feature values and sending the compressed data to the membership function generator.

8. (Original) The classifier in claim 7, wherein the CCD extractor is 24 bits.

9. (Canceled)